AMENDMENTS TO THE CLAIMS

Applicant respectfully requests the following amendments to the claim set:

1. (withdrawn) An internal fluid flow regulator that influences fluid flow about a surface of an internal flow device operating within an enclosed or semi-enclosed environment, said internal fluid flow regulator comprising:

a leading edge comprising a surface capable of receiving a fluid thereon;

a pressure recovery drop that extends a pre-determined distance away from said leading edge, wherein said pressure recovery drop comprises at least one drop face therein, said at least one drop face having a pre-determined drop distance that determines the degree of pressure gradient regulation, said pressure recovery drop functions to regulate existing pressure gradients along said surface to optimize and equalize said fluid flow, wherein said regulation of said pressure gradients functions to optimize said fluid flow, as well as improving the performance of said device;

a sub-atmospheric barrier that is suddenly generated as said fluid encounters and flows over said pressure recovery drop, said sub-atmospheric barrier comprising a low pressure area of fluid molecules having decreased kinetic energy that serve as a cushion between said higher kinetic energy fluid molecules in said fluid and the molecules at said surface to facilitate laminar flow and assist in the reduction of the separation potential of said fluid; and

a trailing edge that defines and extends from the base of said pressure recovery drop that provides a trailing flow boundary for said fluid.

2. (withdrawn) The internal fluid flow regulator of claim 1, wherein said pressure recovery drop is oriented in a position selected from the group consisting of perpendicular to the direction of flow of said fluid, substantially perpendicular to the direction of flow of said fluid, on an angle with respect to said direction of flow of said fluid, parallel or substantially parallel to the direction of flow of said fluid, and any combination of these.

3. (withdrawn) The internal fluid flow regulator of claim 1, wherein said pressure recovery drop comprises a formation selected from the group consisting of linear, curved, spline, and any combination of these.

4. (withdrawn) The internal fluid flow regulator of claim 1, wherein said fluid flow regulator comprises a pressure gradient regulator.

5. (withdrawn) The internal fluid flow regulator of claim 1, wherein said pressure recovery drop extends entirely across said surface.

6. (withdrawn) The internal fluid flow regulator of claim 1, wherein said pressure recovery drop extends across only a portion of said surface.

7. (withdrawn) The internal fluid flow regulator of claim 1, wherein said surface comprises a plurality of fluid flow regulators that function together to regulate, influence, and control fluid flow and its properties and characteristics across said surface.

8. (withdrawn) The internal fluid flow regulator of claim 1, wherein said fluid flow regulator is a dynamic fluid flow regulator capable of adjusting, on demand, with varying design constraints, flow characteristics, environmental conditions, and operational situations pertaining to said fluid, said device, and any combination of these during

9. (withdrawn) The internal fluid flow regulator of claim 8, wherein said dynamic fluid flow regulator comprises at least one selectively adjustable element, wherein said adjustable elements are selected from a movable leading edge, a movable pressure recovery drop, and a movable trailing edge, each capable of adjusting the height of said drop face and said pressure drop.

10. (withdrawn) The internal fluid flow regulator of claim 1, wherein said fluid flow regulator comprises means for effectuating vector positioning about said surface.

11. (withdrawn) The internal fluid flow regulator of claim 1, wherein said fluid flow regulator comprises at least one component that oscillates with varying situations and conditions to vary the height of said pressure recovery drop.

12. (withdrawn) The internal fluid flow regulator of claim 1, wherein said leading edge is integrally formed with said surface.

13. (withdrawn) The internal fluid flow regulator of claim 1, wherein said pressure recovery drop is integrally formed with said surface.

14. (withdrawn) The internal fluid flow regulator of claim 1, wherein said trailing edge is integrally formed with said surface.

15. (withdrawn) The internal fluid flow regulator of claim 1, wherein said leading edge, said pressure recovery drop, and said trailing edge of said fluid flow regulator are each embodied in a fluid flow regulator device that is removably attachable to an existing surface to allow said existing surface to comprise one or more fluid flow regulators.

16. (withdrawn) The internal fluid flow regulator of claim 1, wherein said pressure recovery drop comprises a plurality of drop faces to magnify the influence of fluid flow regulator on said fluid.

17. (withdrawn) The internal fluid flow regulator of claim 16, wherein said plurality of drop faces each comprise a sub-atmospheric barrier.

18. (withdrawn) The internal fluid flow regulator of claim 1, wherein said pressure recovery drop is positioned at or proximate an optimal pressure recovery point defined as the location(s) about said surface at which there is an imbalanced or unequal pressure gradient forward and aft of said fluid, thus creating an adverse pressure within said device, which adverse pressure gradient induces friction and pressure drag that ultimately increases the separation potential of said fluid.

19. (withdrawn) The internal fluid flow regulator of claim 1, wherein said fluid is selected from the group consisting of gaseous fluids, liquid fluids, and any combination of these.

20. (withdrawn) An internal flow surface part of an internal flow device or system, said internal flow surface comprising:

at least one fluid flow regulator comprising a pressure recovery drop having at least one drop face formed therein, said fluid flow regulator functioning to optimize fluid flow over said internal flow surface.

21. (withdrawn) The internal flow surface of claim 20, wherein said fluid flow regulator is integrally formed with said surface.

22. (withdrawn) The internal flow surface of claim 20, wherein said fluid flow regulator is removably attached to said surface.

23. (withdrawn) The internal flow surface of claim 20, wherein said fluid flow regulator is positioned in an orientation selected from the group consisting of perpendicular to the direction of flow of said fluid, substantially perpendicular to the direction of flow of said fluid, on an angle with respect to said direction of flow of said fluid, parallel or substantially parallel to the direction of flow of said fluid, and any combination of these.

24. (withdrawn) The internal flow surface of claim 20, wherein said fluid flow regulator comprises a formation selected from the group consisting of linear, curved, spline, and any combination of these.

25. (withdrawn) The internal flow surface of claim 20, wherein said fluid flow regulator is positioned at or proximate an optimal pressure recovery point that signals a point of fluid separation.

26. (withdrawn) The internal flow surface of claim 20, wherein said fluid flow regulator comprises a dynamic fluid flow regulator that functions to vary the height of said at least one drop face.

27. (withdrawn) The internal flow surface of claim 20, wherein said fluid flow regulator comprises means effectuating vector positioning about said surface.

28. (withdrawn) The internal flow surface of claim 20, wherein said fluid is selected from the group consisting of gaseous fluids, liquid fluids, and any combination of these.

29. (withdrawn) The internal flow surface of claim 20, wherein said pressure recovery drop comprises an orthogonal design.

30. (withdrawn) The internal flow surface of claim 20, wherein said flow device is contained within a semi-enclosed environment.

31. (currently amended) A nozzle comprising:

an intake for initially receiving a fluid therein;

a surface relating with said intake that receives fluid flow thereon;

a discharge providing an exit for said fluid from said nozzle; and

at least one dynamic fluid flow regulator featured and operable with said surface, said fluid flow regulator comprising:

a leading edge,

a trailing edge,

and an orthogonal pressure recovery drop extending between said leading and trailing edges to form a down step, said pressure recovery drop comprising at least one drop face~~.~~, and means for increasing the height of said drop face.

32. (previously presented) The nozzle of claim 31, wherein said fluid flow regulator is positioned to decrease the separation potential of said fluid.

33. (previously presented) The nozzle of claim 31, said fluid encounters and flows over said pressure recovery drop, producing a low pressure area of fluid molecules having decreased kinetic energy at said surface to facilitate laminar flow and assist in the reduction of the separation potential of said fluid.

34. (currently amended) An exhaust system comprising:

an intake coupled to and initially receiving a fluid from a fluid generator;

a surface relating with said intake that receives fluid flow thereon;

a discharge providing an exit for said fluid from said exhaust system; and

at least one dynamic fluid flow regulator featured and operable with said surface, said

fluid flow regulator comprising a leading edge, a trailing edge, and an orthogonal pressure recovery drop extending between said leading and trailing edges to form a down step, said pressure recovery drop comprising at least one drop face of a calculated distance formed therein, and means for vertically positioning the height of said drop, said fluid flow regulator functioning to optimize air flow, reduce separation of said fluid over said surface relating with said intake of said exhaust system, and reduce induced noise.

35. (currently amended) A conduit comprising:

an conduit intake capable of receiving a fluid therein;

a surface relating with said conduit intake that receives fluid flow thereon;

a conduit discharge providing an exit for said fluid from said conduit; and

at least one dynamic fluid flow regulator featured and operable with said surface, said

fluid flow regulator comprising a leading edge, a trailing edge, ~~and~~ a pressure recovery drop extending between said leading and trailing edges to form a down step, and means for adjusting the height of said drop said pressure recovery drop comprising at least one drop face of a calculated distance formed therein, said fluid

flow regulator functioning to optimize air flow, reduce separation of said fluid over said first surface of said conduit, and reduce induced noise.

36. (currently amended) A method for influencing internal fluid flow and regulating pressure gradients within an internal flow device or system and for influencing the rate and magnitude of pressure recovery about a surface within said device, said method comprising the steps of:

featuring at least one fluid flow regulator with one or more surfaces of an internal fluid flow device having at least one surface thereon, said fluid flow regulator comprising:

a pressure recovery drop having at least one drop face formed therein, said drop face comprising a calculated height;

subjecting said device to a fluid, such that said fluid is caused to move within said device; ~~and~~

causing said fluid to encounter said fluid flow regulator, such that said pressure recovery drop induces a sudden drop in pressure as said fluid flows over said fluid flow regulator, wherein a sub-atmospheric barrier is created at the base of said drop face, said fluid flow regulator functioning to optimize fluid flow within said device, thus increasing the performance of said device~~.~~; and

dynamically adjusting the height of said recovery drop in response to variable fluid conditions.

37. (withdrawn) The method of claim 36, wherein said step of featuring comprises the step of positioning said fluid flow regulator at an optimal pressure recovery point.

38. (withdrawn) The method of claim 37, wherein said step of positioning said fluid flow regulator comprises positioning it in an orientation selected from the group consisting of perpendicular to the direction of flow of said fluid, substantially perpendicular to the direction of flow of said fluid, on an angle with respect to said direction of flow of said fluid, parallel or substantially parallel to the direction of flow of said fluid, and any combination of these.

39. (withdrawn) The method of claim 37, further comprising the step of repositioning said fluid flow regulator as said optimal pressure recovery points change in response to varying conditions surrounding said fluid flow.

40. (withdrawn) The method of claim 36, further comprising the step of varying said pressure recovery drop, and particularly said height of said drop face in response to changing conditions.

41. (withdrawn) The method of claim 36, wherein said step of causing said fluid to encounter said fluid flow regulator has the effect of optimizing fluid flow and the performance of said object within said fluid, said fluid flow regulator:

regulating the pressure gradients that exist along said surface by reducing the pressure drag at various locations along said surface, as well as the pressure drag induced within forward and aft of said fluid in said device, via a pressure recovery drop;

increasing pressure recovery and pressure recovery potential as a result of regulating said pressure gradients and reducing said pressure drag;

reducing friction drag along said surface as a result of increasing said pressure recovery; and

decreasing fluid separation and fluid separation potential as a result of said reducing friction drag.

42. (previously presented) The nozzle of claim 31, wherein said pressure recovery drop is oriented in a position selected from the group consisting of perpendicular to the direction of flow of said fluid, substantially perpendicular to the direction of flow of said fluid, on an angle with respect to said direction of flow of said fluid, parallel or substantially parallel to the direction of flow of said fluid, and any combination of these.

43. (previously presented) The nozzle of claim 31, wherein said pressure recovery drop comprises a formation selected from the group consisting of linear, curved, spline, and any combination of these.

44. (previously presented) The nozzle of claim 31, wherein said fluid flow regulator comprises a pressure gradient regulator.

45. (previously presented) The nozzle of claim 31, wherein said pressure recovery drop extends entirely across said surface.

46. (previously presented) The nozzle of claim 31, wherein said pressure recovery drop extends across only a portion of said surface.

47. (previously presented) The nozzle of claim 31, wherein said surface comprises a plurality of fluid flow regulators that function together to regulate, influence, and control fluid flow and its properties and characteristics across said surface.

48. (previously presented) The nozzle of claim 31, wherein said fluid flow regulator is a dynamic fluid flow regulator capable of adjusting, on demand, with varying design constraints, flow characteristics, environmental conditions, and operational situations pertaining to said fluid, said device, and any combination of these during

49. (previously presented) The nozzle of claim 48, wherein said dynamic fluid flow regulator comprises at least one selectively adjustable element, wherein said adjustable elements are selected from a movable leading edge, a movable pressure recovery drop, and a movable trailing edge, each capable of adjusting the height of said drop face and said pressure drop.

50. (previously presented) The nozzle of claim 31, wherein said fluid flow regulator comprises means for effectuating vector positioning about said surface.

51. (previously presented) The nozzle of claim 31, wherein said fluid flow regulator comprises at least one component that oscillates with varying situations and conditions to vary the height of said pressure recovery drop.

52. (previously presented) The nozzle of claim 31, wherein said leading edge is integrally formed with said surface.

53. (previously presented) The nozzle of claim 31, wherein said pressure recovery drop is integrally formed with said surface.

54. (previously presented) The nozzle of claim 31, wherein said trailing edge is integrally formed with said surface.

55. (previously presented) The nozzle of claim 31, wherein said leading edge, said pressure recovery drop, and said trailing edge of said fluid flow regulator are each embodied in a fluid flow regulator device that is removably attachable to an existing surface to allow said existing surface to comprise one or more fluid flow regulators.

56. (previously presented) The nozzle of claim 31, wherein said pressure recovery drop comprises a plurality of drop faces to magnify the influence of fluid flow regulator on said fluid.

57. (previously presented) The exhaust system of claim 56, wherein said plurality of drop faces each comprise a sub-atmospheric barrier.

58. (previously presented) The exhaust system of claim 31, wherein said pressure recovery drop is positioned at or proximate an optimal pressure recovery point defined as the location(s) about said surface at which there is an imbalanced or unequal pressure gradient forward and aft

of said fluid, thus creating an adverse pressure within said device, which adverse pressure gradient induces friction and pressure drag that ultimately increases the separation potential of said fluid.

59. (previously presented) The exhaust system of claim 31, wherein said fluid is selected from the group consisting of gaseous fluids, liquid fluids, and any combination of these.

60. (previously presented) The exhaust system of claim 34, wherein said pressure recovery drop is oriented in a position selected from the group consisting of perpendicular to the direction of flow of said fluid, substantially perpendicular to the direction of flow of said fluid, on an angle with respect to said direction of flow of said fluid, parallel or substantially parallel to the direction of flow of said fluid, and any combination of these.

61. (previously presented) The exhaust system of claim 34, wherein said pressure recovery drop comprises a formation selected from the group consisting of linear, curved, spline, and any combination of these.

62. (previously presented) The exhaust system of claim 34, wherein said fluid flow regulator comprises a pressure gradient regulator.

63. (previously presented) The exhaust system of claim 34, wherein said pressure recovery drop extends entirely across said surface.

64. (previously presented) The exhaust system of claim 34, wherein said pressure recovery drop extends across only a portion of said surface.

65. (previously presented) The exhaust system of claim 34, wherein said surface comprises a plurality of fluid flow regulators that function together to regulate, influence, and control fluid flow and its properties and characteristics across said surface.

66. (previously presented) The exhaust system of claim 34, wherein said fluid flow regulator is a dynamic fluid flow regulator capable of adjusting, on demand, with varying design constraints, flow characteristics, environmental conditions, and operational situations pertaining to said fluid, said device, and any combination of these during.

67. (previously presented) The exhaust system of claim 66, wherein said dynamic fluid flow regulator comprises at least one selectively adjustable element, wherein said adjustable elements are selected from a movable leading edge, a movable pressure recovery drop, and a movable trailing edge, each capable of adjusting the height of said drop face and said pressure drop.

68. (previously presented) The exhaust system of claim 34, wherein said fluid flow regulator comprises means for effectuating vector positioning about said surface.

69. (previously presented) The exhaust system of claim 34, wherein said fluid flow regulator comprises at least one component that oscillates with varying situations and conditions to vary the height of said pressure recovery drop.

70. (previously presented) The exhaust system of claim 34, wherein said leading edge is integrally formed with said surface.

71. (previously presented) The exhaust system of claim 34, wherein said pressure recovery drop is integrally formed with said surface.

72. (previously presented) The exhaust system of claim 34, wherein said trailing edge is integrally formed with said surface.

73. (previously presented) The exhaust system of claim 34, wherein said leading edge, said pressure recovery drop, and said trailing edge of said fluid flow regulator are each embodied in a fluid flow regulator device that is removably attachable to an existing surface to allow said existing surface to comprise one or more fluid flow regulators.

74. (previously presented) The exhaust system of claim 34, wherein said pressure recovery drop comprises a plurality of drop faces to magnify the influence of fluid flow regulator on said fluid.

75. (previously presented) The exhaust system of claim 74, wherein said plurality of drop faces each comprise a sub-atmospheric barrier.

76. (previously presented) The exhaust system of claim 34, wherein said pressure recovery drop is positioned at or proximate an optimal pressure recovery point defined as the location(s) about said surface at which there is an imbalanced or unequal pressure gradient forward and aft of said fluid, thus creating an adverse pressure within said device, which adverse pressure gradient induces friction and pressure drag that ultimately increases the separation potential of said fluid.

77. (previously presented) The exhaust system of claim 34, wherein said fluid is selected from the group consisting of gaseous fluids, liquid fluids, and any combination of these.